UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/854,458	05/15/2001	Ichiro Kyushima	500.40122X00	8081

20457 7590 12/22/2003	EXAMINER
ANTONELLI, TERRY, STOUT & KRAUS, LLP	STEELMAN, MARY J

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ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 NORTH SEVENTEENTH STREET
SUITE 1800
ARLINGTON, VA 22209-9889

DATE MAILED: 12/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>05/15/01, 05/30/01</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 May 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

    a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *3* .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: .

DETAILED ACTION

1.   Claims 1-11 are pending.

Priority

2.   Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers

have been placed of record in the file.

Information Disclosure Statement

3.   The information disclosure statement (IDS) submitted on 05/15/2001 has been

considered.

Drawings

4.   The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they

include the following reference sign(s) not mentioned in the description:

Fig. 7, #704 is not in the Specification. See page 11, line 26.

Fig. 8, #801-806 are not mentioned in the Specification.

Fig. 9, #901-903 & 908-910 are not mentioned in the Specification.

Fig. 10, #1001-1013 are not mentioned in the Specification.

5.   A proposed drawing correction, corrected drawings, or amendment to the specification to

add the reference sign(s) in the description, are required in reply to the Office action to avoid

abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

6.   Claim 8, page 20, line 9, recites, "number a times...", should be –number of times--.

Delete 'a' and insert 'of'.

Claim Rejections - 35 USC § 101

7.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or
> any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and
> requirements of this title.

8.   Claims 6 and 7 are rejected under 35 U.S.C. 101 because the claimed invention is

directed to non-statutory subject matter. "A compiler program", as recited in claim 6 in non

statutory. This can be cured by combining claims 6 and 7, reciting, "A compiler program,

tangibly stored on a computer readable medium, using said compile method according to claim

1." Examiner will treat claims 6 and 7 as if they were combined as noted above.

9.   Claims 10 and 11 are rejected under 35 U.S.C. 101 because the claimed invention is

directed to non-statutory subject matter. "An object program...", as recited in claim 10 is non

statutory. This can be cured by combining claims 10 and 11, reciting, "An object program,

tangibly embodied on a storage medium, generated from a source program including repetitive

loop processing including..." Examiner will treat claims 10 and 11 as if they were combined as

noted above.

Claim Rejections - 35 USC § 103

10.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

11.   Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent

6,462,579 to McKinsey, in view of US Patent 6,631,518 to Bortnikov et al.

Per claim 1, McKinsey disclosed:

(a) generating first object codes using said speculation mechanism from a repetitively executed

fragment of a source program; (Col. 2, lines 60-66, "...compiling source code...generates object

code...inserting a speculation check into object code instructions (object code using

speculation)...")

(b) generating second object codes not using said speculation mechanism from said repetitively

executed fragment of said source program; (Col. 2, lines 65-66, "...storing recovery code

associated with the speculation check..." and col. 4, lines 33-35, "The compiler...provides a

recoverable interval of instructions (not using speculation) for the machine to execute in the case

of failed speculation...")

(c) generating third object codes that perform a control transfer; (Col. 4, lines 50-52, "Explicit recovery code changes the control flow (control transfer) of the optimized program. Speculating a load then implies that control flow should be add to place the recovery code.")

McKinsey failed to disclose a decision based on a rule of "a number of times" a speculation failure is detected by said speculative check instruction during execution of said first object codes satisfies a predetermined condition, said second object codes for said repetitively executed program fragment are executed."

However, Bortnikov disclosed profiling data for each compiled procedure. At col. 2, lines 46-53, "...organizer profile information...benchmarking phase and then, during the optimization phase, provides a system for identifying and utilizing valid profile information..." At col. 4, lines 32-33, Bortnikov disclosed "counters to be updated, accumulating branch decisions." And at col. 6, lines 34-39, "the compiler can make optimization decisions such as...when to allow early speculative execution of instructions..."

Therefore, it would have been obvious, to one of ordinary skill in the art at the time of the invention, to have included profile data as described in Bortnikov's invention to modify McKinsey's invention, because both inventions compile source code into variations of object code, Bortnikov additionally considers data retrieved from profiling when making a decision as to which code version to execute. Using profiling data to make informed decisions is well known in the art.

Per claim 2:

-predetermined condition in said step (c) is that the number of times a speculation failure is

detected exceeds a predetermined value. (Col. 4, lines 58-61 and col. 6, lines 34-39.)

Per claim 3:

-predetermined condition is said step (c) is that a ratio of the number of times a speculation

failure is detected by the speculation check to a number of times the repetitively executed

program fragment is executed exceeds a predetermined value. (Col. 4, lines 58-61 and col. 6,

lines 34-39.)

Per claim 4:

-when a speculation failure is detected by the speculation check, a value of counter is

incremented and when the counter value exceeds a predetermined value, said third object codes

transfer control to execution of said second object codes. (Col. 4, lines 58-61 and col. 6, lines

34-39.)

Per claim 5:

-once said speculation failure is detected, said third object codes transfer control to execution of

said second object codes. (McKinsey, col. 4, lines 33-35, "The compiler of system 10 provides a

recoverable interval of instructions for the machine to execute in the case of failed speculation.")

Per claims 6 and 7:

-a compiler program, on a storage medium, using said compile method according to claim 1.

(McKinsey: See fig. 1 and col. 4, line 4, "compiler system 10".)

Per claims 8, 9, and 10, McKinsey disclosed:

-generating first object codes from said source program by using a speculative instruction and a

speculative check instruction for checking a speculation failure; (Col. 2, lines 60-66,

"...compiling source code...generates object code...inserting a speculation check into object

code instructions (object code using speculation)...")

-generating second object codes from said source program without using said speculative

instruction and said speculative check instruction; (Col. 2, lines 65-66, "...storing recovery code

associated with the speculation check..." and col. 4, lines 33-35, "The compiler...provides a

recoverable interval of instructions (not using speculation) for the machine to execute in the case

of failed speculation...")

-generating third object codes that perform control to first execute said first object codes; (Col.

7, line 66-col. 8, line 3, "...recovery use instructions are never scheduled explicitly. That is, the

candidate selection mechanism never picks these to be scheduled. They are scheduled merely as

a side effect of scheduling a recovery check instruction." In other words, the speculation code is

executed first, with control switching to the non-speculation code upon failure.)

-generating fifth object codes that perform control to execute said second object codes (Col. 4,

lines 50-52, "Explicit recovery code changes the control flow (control transfer) of the optimized

program. Speculating a load then implies that control flow should be add to place the recovery

code (execute non-speculative code).")

McKinsey failed to disclose a decision based on a rule of "a number of times" a

speculation failure is detected by said speculative check instruction during execution of said first

object codes satisfies a predetermined condition, said second object codes for said repetitively

executed program fragment are executed."

However, Bortnikov disclosed profiling data for each compiled procedure. At col. 2,

lines 46-53, "...organizer profile information...benchmarking phase and then, during the

optimization phase, provides a system for identifying and utilizing valid profile information..."

At col. 4, lines 32-33, Bortnikov disclosed "counters to be updated, accumulating branch

decisions."

Therefore, it would have been obvious, to one of ordinary skill in the art at the time of the

invention, to have included profile data as described in Bortnikov's invention to modify

McKinsey's invention, because both inventions compile source code into variations of object

code, Bortnikov additionally considers data retrieved from profiling when making a decision as

to which code version to execute. Using profiling data to make informed decisions is well

known in the art.

Per claim 9:

-a memory device to store said source program; a central processing unit (CPU) to execute a

compiler program for generating said object program from said source program; a display device

to output a result of compile processing executed by said CPU; a bus to connect said memory

device, said CPU and said display device; (See Fig. 1 and col. 4, lines 5-16, "...processor

12...connected (bus) to memory 16...display screen (line 15))

Conclusion

12.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure.

13.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Mary Steelman, whose telephone number is (703) 305-4564. The

examiner can normally be reached Monday through Thursday, from 7:00 A.M. to 5:30 P.M. If

attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan

Dam can be reached on (703) 305-4552.

The fax phone number is (703) 872-9306 for regular communications and for After Final

communications. Any inquiry of a general nature or relating to the status of this application or

proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Mary Steelman

12/10/2003

TUAN DAM
SUPERVISORY PATENT EXAMINER